REMARKS

<u>Priority Document</u>

Applicants submitted a Claim for Priority and certified priority document on November 16, 2001, when the application was filed. Applicants respectfully request that the Examiner acknowledge the Claim for Priority and acknowledge receipt of the priority document in the next Patent Office paper.

<u>35 U.S.C. §103 Rejections</u>

The present Amendment amends claims 1, 6 and 24 and leaves claims 2-5 and 7-10 unchanged. Therefore, the present application has pending claims 1-10 and 24.

Claims 1-10 and 24 stand rejected as being unpatentable over Bridge in view of Wilding, et al. ("Wilding"). This rejection is traversed for the following reasons. Applicants submit that the features of the present invention, as now more clearly recited in claims 1-10 and 24, are not taught or suggested by Bridge or Wilding, whether taken individually or in combination with each other as suggested by the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

Amendments were made to the claims so as to more clearly describe features of the present invention. Specifically, the claims were amended to more clearly describe that the present invention is directed to a database management system and database management program, as recited, for example, in claims 1, 6 and 24.

Claims 1-10

The present invention as recited in claims 1 and 6 provides a database management system and a database management program installed in a database management system. The database management system includes a storage area correspondence table, a storage having first and second storage areas, and an acceptance section for accepting a data processing request. The data processing request includes data processing and data rebalance. The database management system further includes a plurality of means for concurrently executing both the data processing and the data rebalance, where the means for concurrently executing includes means for determining to move data among the plurality of storages and the storage added by the acceptance section based on copy position information. Also, in the present invention, the plurality of means for concurrently executing is connected to the acceptance section. The prior art does not teach or suggest all these features.

The above described features of the present invention, now more clearly recited in the claims, are not taught or suggested by any of the references of record. More specifically, the features are not taught or suggested by either Bridge or Wilding, whether taken individually or in combination with each other.

Bridge discloses a system and method for managing storage, and a rebalance process for removing imbalances in disk drives. However, Bridge does not teach or suggest concurrently executing both the data processing and the rebalance operation, as recited in claims 1 and 6 of the present invention. Furthermore, as conceded by the Examiner, Bridge does not teach or suggest a storage area

correspondence table for data items to be determined to be sharedly stored among a plurality of storages or where the acceptance sections adds copy position information to copy source data when the request includes data processing causing the addition of storage, as recited in claims 1 and 6 of the present invention.

Bridge's system and method for managing storage includes receiving requests for input/output (I/O) operations. As more I/O operations are performed, it may be necessary to add disk drives to increase the amount of available storage to support the additional I/O operations. The system and method performs automatic online disk drive space reorganization for the incremental addition or removal of storage capacity. In Bridge, I/O requests are made, the amount of storage space may be increased to support those request, and over time, fluctuations and the addition and/or deletion of disk drives may cause some disk drives in a disk group to have more data than other disks drives, and a logical volume may become unevenly distributed across disk drives in a disk group. These imbalances may be removed by running one or more rebalancing processes.

The database management system and database management program, as recited in claims 1-10, include concurrently executing both the data processing in a plurality of storages and the data rebalance. This feature differs from the teachings of Bridge. In the present invention, for example, both the data processing in the plurality of storages and the data rebalance are executed **concurrently**. Bridge does not execute the data processing and the data rebalance in the manner claimed. As described in column 3, lines 21-23, Bridge teaches the reorganization, or rebalance, of disk drives in response to the incremental addition or removal of

storage capacity. In Bridge, storage capacity may be added to support additional I/O requests for operations. Bridge does not execute these I/O operations at the same time as the rebalance operation as in the present invention.

Therefore, Bridge does not teach or suggest "a plurality of means for concurrently executing both the data processing in the plurality of storages and the data rebalance" as recited in claim 1, and as similarly recited in claim 6.

Furthermore, as conceded by the Examiner, Bridge does not teach or suggest "a storage area correspondence table for data items to be determined to be sharedly stored among said plurality of storages".

Even further, as conceded by the Examiner, Bridge does not teach or suggest "wherein said acceptance section adds copy position information to copy source data when said request includes data processing causing to add a storage" as recited in claim 1, and as similarly recited in claim 6.

The above noted deficiencies of Bridge are not supplied by any of the other references, particularly Wilding. Therefore, combining the teachings of Bridge with Wilding still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Wilding teaches a method and apparatus for creating a log record of data, where the data represents one or more changes made to the data contents of a database management system. The log record of data is stored in a transaction log buffer, and the log buffer is divided into a number of sections called "chunks". Once a chunk is filled with data, the data is transferred to permanent storage.

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Unlike the present invention, Wilding does not teach or suggest executing data processing operations concurrently with rebalance operations. Instead, Wilding teaches filling chunks with data, and transferring the data to permanent storage once a chunk is filled. The filling of the chunks with data and the subsequent transfer of data are separate operations. Accordingly, Wilding fails to teach executing data processing occurring at the same time as a rebalance operation.

Moreover, Wilding does not teach or suggest the use of a storage area correspondence table in the manner claimed. The use of a table is not at all disclosed in Wilding. In Wilding, data is transferred from the chunks to permanent storage once each chunk is filled. No determination is made with respect to a storage area correspondence table, as in the present invention.

Wilding also fails to teach or suggest where the acceptance section adds copy position information to copy source data when there is a request for data processing, resulting in an addition of storage, as claimed. As described in Wilding, column 11, lines 45 to 67, the position in the log buffer that the log data should be copied to is determined. This copy position determination relates to the placement of the log data into the log buffer only. As such, Wilding does not teach an acceptance section that adds copy position information to copy source data, in the manner claimed.

Therefore, Wilding does not teach or suggest "a plurality of means for concurrently executing both the data processing in the plurality of storages and the data rebalance" as recited in claim 1, and as similarly recited in claim 6.

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Furthermore, and contrary to the Examiner's assertions, Wilding does not teach or suggest "a storage area correspondence table for data items to be determined to be sharedly stored among said plurality of storages".

Even further, and contrary to the Examiner's assertions, Wilding does not teach or suggest "wherein said acceptance section adds copy position information to copy source data when said request includes data processing causing to add a storage" as recited in claim 1, and as similarly recited in claim 6.

Claim 24

The present invention as recited in claim 24 provides a program read into a computer and run over a database under control of a computer to execute steps for database management. At the time of starting the program, one step includes confirming the presence or absence of an area for storing information for identification of an additional storage for storing table data and information for identifying an "in rebalance operation". During the rebalance operation, data is moved from a plurality of storages to the additional storage in accordance with a predetermined division rule of table data to be stored among the plurality of storages and the additional storage. For example, as shown in Fig. 3 and as described on page 15, line 15 to page 17, line 18, a table includes predetermined rules regarding the division of data amongst the plurality of storage and additional storage. In the absence of the area, the program includes a step of securing the area when data processing in the plurality of storages is executed. The prior art does not teach or suggest all these features.

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The above described features of the present invention, now more clearly recited in claim 24, are not taught or suggested by any of the references of record. More specifically, the features are not taught or suggested by either Bridge or Wilding, whether taken individually or in combination with each other.

In the Office Action, the Examiner asserts that Bridge discloses confirming the presence or absence of an area for storing information for identification of an additional storage for storing table data and information indicative of an 'in rebalance operation', where the step of confirming occurs at the time of starting the program. To support this assertion, the Examiner cites column 4, line 64 to column 5, line 14; column 6, lines 57-66; column 22, lines 45-47; and column 23, lines 49-55.

Bridge discloses a system and method for managing storage, and a rebalance process for removing imbalances in disk drives. However, Bridge does not disclose confirming the presence or absence of an area, at the time of starting the program, where the area stores information for identifying an additional storage for storing table data and information, such as a flag, that indicates that a rebalance operation is occurring. The cited passages provided by the Examiner do not disclose this feature. Therefore, the Examiner is invited to more specifically point out where Bridge discloses an area for storing information for identifying an additional storage for storing table data and information indicating that a rebalance is occurring, or to withdraw the rejection.

Therefore, Bridge fails to teach or suggest "at the time of starting the program, confirming the presence or absence of an area for storing information for

<u>identification of an additional storage for storing table data and information indicative</u> <u>of an 'in rebalance operation'</u>" as recited in claim 24.

Furthermore, as conceded by the Examiner, Bridge fails to teach or suggest "<u>during the 'in rebalance operation', moving data from a plurality of storages to said</u> <u>additional storage in accordance with a predetermined division rule of table data to</u> <u>be stored among said plurality of storages and said additional storage</u>" as recited in claim 24.

The above noted deficiencies of Bridge are not supplied by any of the other references, particularly Wilding. Therefore, combining the teachings of Bridge with Wilding still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

In the Office Action, the Examiner concedes that Bridge does not teach "a predetermined division rule of table data to be stored among said plurality of storages." However, the Examiner asserts that Wilding discloses this feature, as described by the disclosed "chunk", the summary of the invention and column 11, lines 45-49, and as shown in Fig. 1.

Contrary to the Examiner's assertions, Wilding does not teach moving data according to a predetermined division rule of table data, as claimed. As described in column 9, lines 63-67 to column 10, lines 1-18, and as shown in Fig. 1, Wilding discloses a transaction log buffer 1. This log buffer is divided into a number of sections 7, called "chunks". Each chunk is sequentially filled, beginning with chunk 1, chunk 2, etc., as reservations are established. When data fills one chunk, the data is then transferred to permanent storage. As such, this procedure disclosed in

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Wilding does not rely upon a predetermined division rule of table data to move the data as in the present invention. Furthermore, the use of a table or table data is not at all disclosed in Wilding.

Therefore, Wilding fails to teach or suggest "during the 'in rebalance operation', moving data from a plurality of storages to said additional storage in accordance with a predetermined division rule of table data to be stored among said plurality of storages and said additional storage" as recited in claim 24.

In addition, Bridge fails to teach or suggest "at the time of starting the program, confirming the presence or absence of an area for storing information for identification of an additional storage for storing table data and information indicative of an 'in rebalance operation'" as recited in claim 24.

Both Bridge and Wilding suffer from the same deficiencies relative to the features of the present invention as recited in the claims. Therefore, combining the teachings of Bridge and Wilding in the manner suggested by the Examiner does not render obvious the features of the present invention as now more clearly recited in claims 1-10 and 24. Accordingly, reconsideration and withdrawal of the 35 USC §103(a) rejection of claims 1-10 and 24 as being unpatentable over Bridge in view of Wilding is respectfully requested.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references used in the rejection of claims 1-10 and 24.

In view of the foregoing amendments and remarks, Applicants submit that claims 1-10 and 24 are in condition for allowance. Accordingly, early allowance of such claims is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Mattingly, Stanger & Malur, P.C., Deposit Account No. 50-1417 (referencing attorney docket no. 500.40877X00).

Respectfully submitted,

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Attachment: Replacement Sheet

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Amendments to the Drawings

The attached sheet of drawings includes changes to Fig. 2. In Fig. 2, changes were made to items 410a, 410b and 410c to be consistent with the description on page 11, lines 25-27 of the specification. That is, the term "DBMS Acceptance Node" was changed to --DBMS Execution Node--.